CLAIMS

What is claimed is:

1. A method of treating a subject suffering from pain comprising the step of administering to the subject an effective amount of a lactoferrin composition to provide an improvement in pain in the subject.

2. The method of claim 1, wherein the pain is acute or chronic pain.

3. The method of claim 1 wherein said lactoferrin composition reduces the severity of the patient's pain.

4. The method of claim 1, wherein said lactoferrin composition is dispersed in a pharmaceutically acceptable carrier.

5. The method of claim 1, wherein said lactoferrin is mammalian lactoferrin.

6. The method of claim 5, wherein said lactoferrin is human or bovine.

7. The method of claim 1, wherein said lactoferrin is recombinant lactoferrin.

8. The method of claim 1, wherein said lactoferrin composition comprises an N-terminal lactoferrin variant.

9. The method of claim 8, wherein the N-terminal lactoferrin variant lacks at least the N-terminal glycine residue.

10. The method of claim 9, wherein said N-terminal lactoferrin variant comprises at least 1% to at least 50% of the lactoferrin composition.

11. The method of claim 1, wherein said lactoferrin is administered orally.

12. The method of claim 1, wherein said lactoferrin is administered parenterally.

13. The method of claim 1, wherein said lactoferrin is administered topically.

14. The method of claim 11 further comprising administering an antacid in conjunction with said lactoferrin composition.

15. The method of claim 11 further comprising administering the lactoferrin in a delayed release formulation.

16. The method of claim 15, wherein the lactoferrin release occurs in the small intestine.

17. The method of claim 15, wherein the lactoferrin release occurs in the large intestine.

18. The method of claim 1, wherein the amount of the composition that is administered is about 1 ng to about 100 g per day.

19. The method of claim 1, wherein the amount of the composition that is administered is about 0.1 g to about 10 g per day.

20. The method of claim 1, wherein said lactoferrin composition reduces the production or activity of pro-inflammatory cytokines.

21. The method of claim 1, wherein said lactoferrin composition enhances the production or activity of cytokines.

22. The method of claim 21, wherein the cytokine is TNF-α.

23. The method of claim 1 further comprising administering a metal chelator dispersed in a pharmaceutically acceptable carrier.

24. The method of claim 23 wherein the metal chelator is ethylenediaminoetetracacetic acid (EDTA) or [etheylenebis(oxyethylenenitrilo)]tetraacetic acid (EGTA).

25. The method of claim 24 wherein the metal chelator is EDTA.

26. The method of claim 25 wherein the amount of EDTA that is administered is about 1 ng to about 1 g per day.

27. The method of claim 1 further comprising administering a lactoferrin composition in combination with a pharmacological agent used to relieve pain.

28. The method of claim 27, wherein the pharmacological agent is selected from the group consisting of non-steroidal anti-inflammatory drugs (NSAIDS), opioid analgesics, second generation NSAIDs and anti-depressant drugs.

29. The method of claim 1 further comprising administering a lactoferrin composition in combination with a non-pharmacological pain management technique.

30. The method of claim 29 wherein the non-pharmacological pain management technique is selected from the group consisting of acupuncture, acupressure, local anesthesia, regional anesthesia, general anesthesia and chiropractic.

31. The method of claim 30, wherein regional anesthesia is spinal anesthesia.

32. The method of claim 30, wherein general anesthesia is intravenous anesthetics or opioid pump.

33. A method of modulating acute pain in a subject comprising the step of administering to the subject an effective amount of a lactoferrin composition to provide an improvement in acute pain in the subject.

34. A method of modulating chronic pain in a subject comprising the step of administering to the subject an effective amount of a lactoferrin composition to provide an improvement in chronic pain in the subject.